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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.  | CONFIRMATION NO. |
|-----------------|-------------|----------------------|----------------------|------------------|
| 09/576,727      | 05/23/2000  | Chad A. Cobbley      | 3639.1US (97-1383.1) | 3108             |

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03/18/2008

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| EXAMINER |
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TRINH, MINH N

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| ART UNIT | PAPER NUMBER |
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3729

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| MAIL DATE | DELIVERY MODE |
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03/18/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                       |  |
|------------------------------|--------------------------------------|---------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/576,727 | <b>Applicant(s)</b><br>COBBLEY ET AL. |  |
|                              | <b>Examiner</b><br>Minh Trinh        | <b>Art Unit</b><br>3729               |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on an RCE filed on 2/4/08.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3,5,6,8,18-20,22,23 and 25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,6,8,18-20,22,23 and 25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission of an RCE filed on 2/4/08 has been entered.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-3, 6, 8, 18-20, 22, 23 and 25, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakemi et al (US 5,655,704) in view of US provisional application No. 60/078472 to Fjelstad.

Sakemi et al disclose an apparatus or an assembly system for placing a plurality of conductive spheres on a substrate comprising: a stencil plate 4 with upper and lower surfaces and a first pattern of plurality of through holes 4a, said stencil plate configured to place a plurality of conductive spheres 3 in said first pattern on a approximate surface of the substrate 2(see Figs. 3-4); a hopper (container 12) extending across at least a portion of the upper surface of said stencil plate 4 and closely spaced (gap between 12 and surface of 4) therefrom to maintain control over all the spheres therein (see Fig. 4, col. 4, lines 28-36) the hopper 12 having a bottom opening with a dimension extending across the first pattern for dispersing said spheres into the through holes 4a of the

stencil plate 4 and a position apparatus 8 (see Fig. 1) for moving the hopper 12 over the first pattern relative to the stencil plate 4 (see Fig. 4) for place said spheres into said through holes 4a onto the proximate surface of said substrate 2 (see Fig. 4). Sakemi et al do not teach the through hole of the stencil having a diameter in the range of about 2-10 of a conductive sphere. The Fjelstad discloses that (see Figs. 1-5, and the discussion at page 2, 2<sup>nd</sup> paragraph for the teachings of apertures 125/135 of and its diameter configuration requirements within the range of the present application such as about 2-10 of the size of the solder sphere (see 125 or 135 of Fig. 1), further, the Fjelstad also discloses the bottom surface of the hopper spaced from the top of the stencil as about less than one half the size of the sphere (see Fig. 2). Therefore, it would have been obvious to one having skill in the art at the time of the invention was made to employ the Fjestad's teaching as described above onto the invention of Sakemi for various known benefits that including delivering solder sphere for attaching the solder ball to the mounting terminals effectively and efficiently, etc.

Regarding the amended subject matter as amended to claims 1 and 18 such as where "a hopper having side walls formed at an angle from an upper opening for feeding spheres into a small bottom opening". This appears to met by either of the prior art references (see Fig. 4 of the Sakemi at al or Fig. 2 of the Fjelstad each shows the feature as described above where "the hopper having side walls which formed at a right an angle from an upper opening for feeding spheres into a small bottom opening).

Furthermore, regarding the side wall and it angle configurations set forth in claims 1 and 18. It would have been an obvious matter of design choice to choose any desired hopper side walls at an angle from an upper opening or the like since applicant

has not disclosed that these features are critical, patentably distinguishing features and it appears that the invention would perform equally well with the teachings as provided from either references where the angle being perpendicular to the upper opening as shown by each reference (see Fig. 4 of the Sakemi et al or Fig. 2 of the Fjelstad).

As applied to claims 2-3 and 6, Sakemi et al teach the spheres being dropped and passed downwardly through the through holes by gravitation force as recited in claim 2 (see Fig. 4 which shows the solder balls being gravity fed into the mounting pads of the substrate 2); and the limitations of claims 3 and 6 (refer to Fig. 4 and the discussion at col. 4, lines 28-36).

As applied to claim 8, Sakemi et al teach the stencil 4 is being placed apart from the substrate 2 (see illustration of Fig. 4).

As applied to claim 5 and 22, Sakemi et al do not teach the first pattern holes diameter is greater than the diameter of each of the spheres by up to 1mm. With respect to the above configurations, it would have been an obvious matter of design choice to choose pattern holes diameter greater than the diameter of the spheres, since applicant has not disclosed that the exact size configurations as described above is critical which would solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the with the size configurations as disclosed by each of the prior art references (i.e., see Fig. 4 of Sakemi et al, which shows the pattern holes 4a being greater than the diameter of the spheres 3, etc).

As applied to claims 19-20 and 23, Sakemi et al teach the spheres being dropped and passed downwardly through the through holes by gravitation force as

recited in claim 19 (see Fig. 4 which shows the solder balls being gravity feed into the mounting pads of the substrate 2); and the limitations of claims 20 and 23 (see Fig. 4, and the discussion at col. 4, lines 28-36).

As applied to claim 25, Sakemi et al teach the stencil 4 being placed apart from the substrate 2 (see illustration of Fig. 4).

4. Additionally, claims 1-3, 6, 8, 18-20, 22, 23 and 25, are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakemi et al and Fjelstad and further in view of Kajii (6253985).

If argues that the combination of Sakemi et al or Fjelstad as modified as applied above does not teach the hopper side walls angle configuration. The Kajii discloses that (see Figs. 1-2, depict the hopper 13 having the above configurations where side walls being at an angle to the upper opening). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to employ the Kajii 's teaching as described above onto the invention of Sakemi et al /Fjelstad in order to form a hopper for supplying solder ball by gravity feed, etc.

### ***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh Trinh whose telephone number is (571) 272-4569. The examiner can normally be reached on Monday -Thursday 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (571) 272-4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

mt

3/13/08

/Minh Trinh/  
Primary Examiner, Art Unit 3729